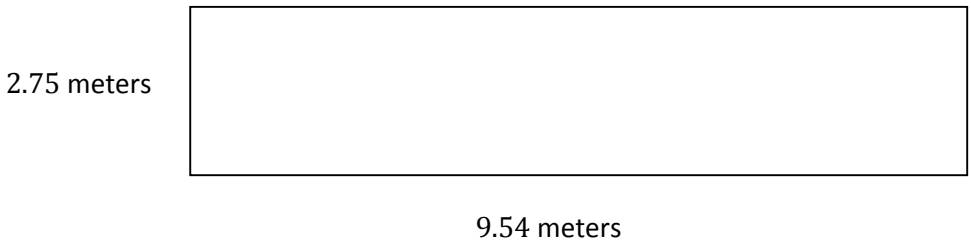
Name _____ Date _____

1. L.B. Johnson Middle School held a track and field event during the school year. The chess club sold various drink and snack items for the participants and the audience. All together, they sold 486 items that totaled $2,673.
   If the chess club sold each item for the same price, calculate the price of each item.

2. The long jump pit was recently rebuilt to make it level with the runway. Volunteers provided pieces of wood to frame the pit. Each piece of wood provided measures 1.8 meters.



   a. Determine the amount of wood, in meters, needed to rebuild the frame.

   b. Since boards can only be purchased in 1.8 meter lengths, how many boards should the volunteers bring to frame the long jump pit?

3. Andy runs 43.68 meters in 6.1 seconds.

   a. If Andy runs at a constant speed, how far does he run in one second? Give your answer to the nearest tenth of a meter.

   b. Using the following expression, place a decimal point in the divisor and the dividend to create a new problem with the same answer as in 3(a).

$$4\ 3\ 6\ 8 \div 6\ 1\ 0\ 0$$

   c. Explain how you know the answer will be the same.

4. The PTA created a cross-country trail for the meet.

   a. The PTA placed a trail marker in the ground every four hundred yards. Every nine hundred yards the PTA set up a water station. What is the shortest distance a runner will have to run to see both a water station and trail marker at the same location?

Answer: _____hundred yards

   b. The PTA wants to cover the wet areas of the trail with wood chips. They find that one bag of

wood chips covers a $3\frac{1}{2}$ yards section of the trail. If there is a wet section of the trail that is approximately $50\frac{1}{4}$ yards long, how many bags of wood chips are needed to cover the wet section of the trail?

5. Yasmine is having a birthday party with snacks and activities for her guests. At one table, five people are sharing three-quarters of a pizza.

   a. What equal-sized portion of the whole pizza will each of the five people receive? Show your work.

   b. If three-quarters of the pizza provided 12 pieces to the table, how many pieces were in the pizza when it was full? Support your answer with models.

6. Yasmine needs to create invitations for the party. She has $\frac{3}{4}$ of an hour to make the invitations. It takes her $\frac{1}{12}$ of an hour to make each card. How many invitations can Yasmine create?

7. Yasmine is serving ice cream with the birthday cake at her party. She has purchased $19\frac{1}{2}$ pints of

ice cream. She will serve $\frac{3}{4}$ of a pint to each guest.

a. How many guests can be served ice cream?

b. Will there be any ice cream left? Justify your answer.

8. L.B. Johnson Middle School held a track and field event during the school year. Miguel took part in a four-person shot put team. Shot put is a track and field event where athletes throw (or "put") a heavy sphere, called a "shot," as far as possible. To determine a team score, the distances of all team members are added. The team with the greatest score wins first place. The current winning team's final score at the shot put is 52.08 ft. Miguel's teammates threw the shot put the following distances: 12.26 ft., 12.82 ft., and 13.75 ft. Exactly how many feet will Miguel need to throw the shot put in order to tie the current first place score? Show your work.

9. The sand pit for the long jump has a width of 2.75 meters and a length of 9.54 meters. Just in

case it rains, the principal wants to cover the sand pit with a piece of plastic the night before the event.

a. Use estimation to determine how many square meters of plastic the principal needs to cover the long jump pit.

b. Explain how your estimation strategy will provide a large enough piece of plastic to completely cover the long jump pit.

10. The chess club is selling drinks during the track and field event. The club purchased water, juice boxes, and pouches of lemonade for the event. They spent $\$138.52$ on juice boxes and $\$75.00$ on lemonade. The club purchased three cases of water. Each case of water costs $\$6.80$. What is the total cost of the drinks?

A Progression Toward Mastery					
Assessment Task Item		**STEP 1 Missing or incorrect answer and little evidence of reasoning or application of mathematics to solve the problem.**	**STEP 2 Missing or incorrect answer but evidence of some reasoning or application of mathematics to solve the problem.**	**STEP 3 A correct answer with some evidence of reasoning or application of mathematics to solve the problem, OR an incorrect answer with substantial evidence of solid reasoning or application of mathematics to solve the problem.**	**STEP 4 A correct answer supported by substantial evidence of solid reasoning or application of mathematics to solve the problem.**
1	**a** 6.NS.B.2	Student response is missing or depicts inaccurate operation choice.	Student response is inaccurate and does not represent the correct place value.	Student response is inaccurate through minor calculation errors; however, place value is represented accurately.	Student response is correct. The price of each item is determined as $5.50, where place value is represented accurately.
2	**a** 6.NS.B.3	Student response is incorrect or missing. Students merely included one length and one side in the calculation.	Student response is incorrect based on place value.	Student response depicts understanding of the addition algorithm, but minor calculation errors hinder the correct sum of 24.58 meters.	Student calculations include all sides of the sand pit. Student applied the standard algorithm of addition of decimals to determine the correct sum of 24.58 meters.
	b 6.NS.B.3	Student response is missing or incorrect.	Student response is a decimal and not a whole number.	Student response is another whole number, not 14.	Student response is correct (14 boards).
3	**a** 6.NS.B.3	Student response is incorrect or missing.	Student response is incorrect. Decimals have been changed inaccurately.	Student response is correct, but the quotient of 7.160 is not rounded to the nearest tenth. OR	Student response is correct, depicting accurate place value in order to generate a whole number dividend. Calculations

				Student calculations are incorrect, but represent knowledge of place value.	are flawless, and the answer is 7.2.
	b **6.NS.B.3**	Student response is missing.	Student response is incorrect or indicates the same decimal placements from the previous problem.	Student response accurately places decimals within the divisor (61.00) and dividend (436.8) to generate a quotient of 7.160.	
	c **6.NS.B.3**	Student response is missing.	Student response is vague or incomplete.	Student response indicates understanding of place value and/or powers of 10 when dividing decimals.	
4	**a** **6.NS.B.4**	Student response is incorrect or missing. Response is a result of finding the sum of or the difference between 9 and 4.	Student response is incorrect or is simply the product of 4 and 9 with no justification.	Student response accurately finds the least common multiple of 4 and 9, but the response is determined as 36, instead of 36 hundred or $3{,}600$ yards or the correct response reflects finding the LCM of 400 and 900.	Student response is accurately determined through finding the least common multiple. The response represents an understanding of the unit "hundred" as a means of efficiently determining LCM using 4 and 9, instead of 400 and 900.
	b **6.NS.A.1**	Student response is incorrect or missing. Response includes inappropriate operations, such as addition, subtraction, or multiplication.	Student response is incorrect due to inaccurate calculations when converting mixed numbers or when finding the quotients of the fractions.	Student response is correctly determined through mixed number conversion and division of fractions, but is inaccurately left as a mixed number $(14\frac{5}{14})$.	Student response is accurately demonstrated through the use of visual models, such as a number line. The response is confirmed through precise mixed number conversion and division of fractions. The need for 15 bags satisfies understanding that the quotient $(14\frac{5}{14})$ is not a whole

					number AND that 14 bags is not sufficient.
5	**a** **6.NS.A.1**	Student response is incorrect. OR Student did not answer the question.	Student response is incorrect, but a portion of the equation has reasoning. For example, the student may have figured out to divide by five but did not multiply by $\frac{1}{5}$ to determine the quotient.	Student response is incorrect; however, the equation shows reasoning. The equation supports dividing by 5 and makes connection to multiplying by $\frac{1}{5}$ to determine the quotient of $\frac{3}{20}$, but computation is incorrect.	Student response of $\frac{3}{20}$ is correct. The equation depicts the situation and makes connections between division and multiplication. All calculations are correct.
	b **6.NS.A.1**	Student response is incorrect. Student found the product of $\frac{3}{4} \times 12$ to arrive at 9 as the solution. OR Student response is incorrect and is not supported with visual models.	Student response of 16 pieces is correct, but is not supported with visual models. OR Student response is incorrect with no support but shows general understanding of the equation.	Student response of 16 is correct. Student arrived at the answer using an equation, but did not support reasoning with a model. OR Student calculation is incorrect, but visual models support reasoning.	Student response of 16 is correct. Student supported the solution with appropriate visual models and determined the amount of each portion in order to determine the full amount.
6	**6.NS.A.1**	Student response is incorrect or missing. OR Student computed the product of the given fractions instead of determining the quotient.	Student response is correct but includes no computation to support reasoning.	Student response is correct. Student computed the quotient as 9 invitations but showed minimal computation.	Student response of 9 invitations is correct. Student demonstrated evidence of reasoning through concise application of an equation with accurate calculations.

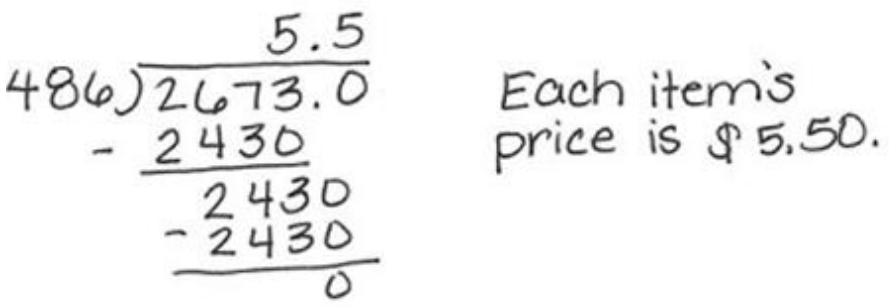
7	**a** **6.NS.A.1**	Student response is incorrect or missing. OR Student determined the product of $19\frac{1}{2}$ and $\frac{3}{4}$.	Student response is correct but shows no computation or reasoning. OR Student response is incorrect, but reasoning is evident through calculations.	Student response of 26 people is correct and represents some reasoning through calculation. OR Student response shows reasoning and application of mixed number conversion but includes errors in calculation.	Student response is correct. Reasoning is evident through correct mixed number conversion. The quotient of 26 people is determined using apparent understanding of factors.
	b **6.NS.A.1**	Student response is missing.	Student response is incorrect and does not depict understanding of whole and mixed numbers.	Student response correctly determines that there will be no leftover ice cream but is not supported with a clear understanding of whole and mixed numbers.	Student response is correct. Student explanation and reasoning include the understanding that a mixed number response will provide left over ice cream where a whole number response would not.
8	**6.NS.B.3**	Student response is incorrect. Justification does not include adding the given throw distances and determining the difference of that sum and the distance needed to tie for first place. The student response may show only addition.	Student response is incorrect but attempts to determine the sum of the throw distances first and then the difference of the sum and the distance needed to tie first place.	Student response is incorrect due to slight miscalculations when adding or subtracting. It is evident that the student understands the process of adding the decimals first, then subtracting the sum from the other team's final score.	Student response is correct. Student accurately determines the sum of the throw distances as 38.83 feet and the differences between that sum and the score needed to tie as 13.25 feet. It is evident that the student understands the process of adding the decimals first, then subtracting the sum from the other team's final score.

9	**a** **6.NS.B.3**	Student response is incorrect or missing.	Student response is missing estimation before calculating. OR students estimate using only the whole number or rounding inaccurately.	Students estimate correctly, but their calculations are incorrect.	Student response is correct and shows complete understanding of estimating and provides enough plastic to cover the long jump pit.
	b **6.NS.B.3**	Student response is incorrect or missing.	Student response shows the math to prove their answer, but doesn't explain how their estimation strategy provides an adequate amount of material.	Students provide a reasonable explanation for why their estimation strategy would give an answer greater or equal to the actual answer.	
10	**6.NS.B.3**	Student response is incorrect or missing. The response disregards finding the total price of the water.	Student response is incorrect. Student finds the total price of the water only.	Student response is incorrect. Student finds the total price of the water and adds it to the price of the lemonade and juice but makes minor computation errors.	Student response is correct. The student finds the total price of the water to be $20.40 and accurately adds it to the price of the lemonade and juice to determine a total cost of $233.92.

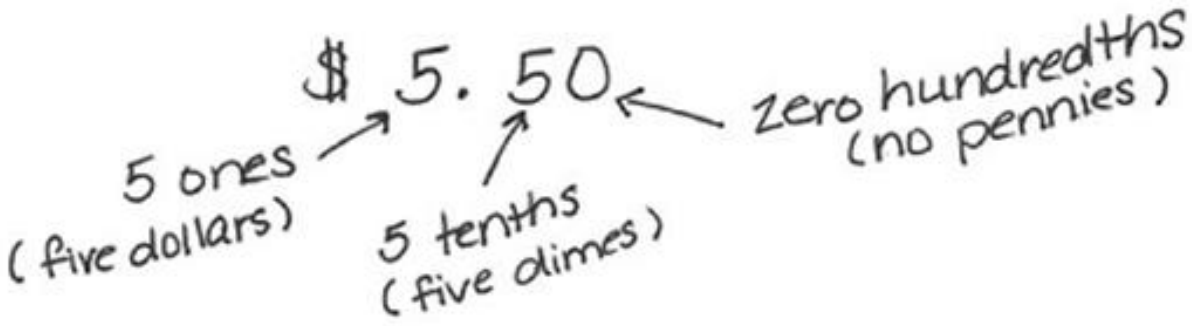
Name _____ Date _____

1. L.B. Johnson Middle School held a track and field event during the school year. The chess club sold various drink and snack items for the participants and the audience. All together, they sold 486 items that totaled $2,673.

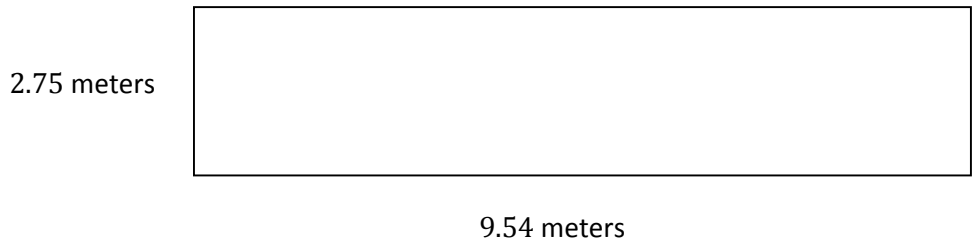
   a. If the chess club sold each item for the same price, calculate the price of each item.



   b. Explain the value of each digit in your answer to 1(a) using place value terms.



2. The long jump pit was recently rebuilt to make it level with the runway. Volunteers provided pieces of wood to frame the pit. Each piece of wood provided measures 6 feet, which is approximately 1.8287 meters.



a. Determine the amount of wood, in meters, needed to rebuild the frame.

$$\begin{array}{r} 9.54 \\ 9.54 \\ 2.75 \\ +\ 2.75 \\ \hline 24.58\text{m} \end{array}$$

b. How many boards did the volunteers supply? Round your calculations to the nearest hundredth and then provide the whole number of boards supplied.

$$\frac{24.58 \cdot 10{,}000}{1.8287 \cdot 10{,}000} = \frac{245800}{18287}$$

$$\begin{array}{r} 13.4412 \\ 18287\overline{)245800.0000} \\ -\ 18287 \\ \hline 62930 \\ -\ 54861 \\ \hline 80690 \\ -\ 73148 \\ \hline 75420 \\ -\ 73148 \\ \hline 22720 \\ -\ 18287 \\ \hline 44330 \\ -\ 36574 \\ \hline 7756 \end{array}$$

13.441 boards.
To have enough, the volunteers supplied 14 boards.

3. Andy runs 436.8 meters in 62.08 seconds.

   a. If Andy runs at a constant speed, how far does he run in one second? Give your answer to the nearest tenth of a second.

$\frac{436.8}{62.08}$

Andy ran 7.0 meters in one second.

$$\begin{array}{r} 7.03 \\ 6208\overline{)43680.00} \\ -43456 \\ \hline 2240 \\ = \quad 0 \\ \hline 22400 \\ -18624 \\ \hline 3776 \end{array}$$

   b. Use place value, multiplication with powers of 10, or equivalent fractions to explain what is happening mathematically to the decimal points in the divisor and dividend before dividing.

$\frac{436.8 \cdot 100}{62.08 \cdot 100} = \frac{43680}{6,208}$

When you write the problem as a fraction, multiply the numerator and denominator by 100. Multiplying each by 100 resulted in both numbers being whole numbers.

436.8 ÷ 62.08 is the same as 43,680 ÷ 6,208.

   c. In the following expression, place a decimal point in the divisor and the dividend to create a new problem with the same answer as in 3(a). Then, explain how you know the answer will be the same. (6.NS.3 – Lesson 15)

43.68 ÷ 6.208

$\frac{436.8 \div 10}{62.08 \div 10} = \frac{43.68}{6.208}$

numerator and denominator by 1,000 or divide each by 10.

$\frac{43.68 \cdot 1{,}000}{6.208 \cdot 1{,}000} = \frac{43{,}680}{6{,}208}$

4. The PTA created a cross-country trail for the meet.

   a. The PTA placed a trail marker in the ground every four hundred yards. Every nine hundred yards the PTA set up a water station. What is the shortest distance a runner will have to run to see both a water station and trail marker at the same location?

4 (hundred) = 2 • 2

9 (hundred) = 3 • 3

LCM 2 • 2 • 3 • 3 = 36 hundred

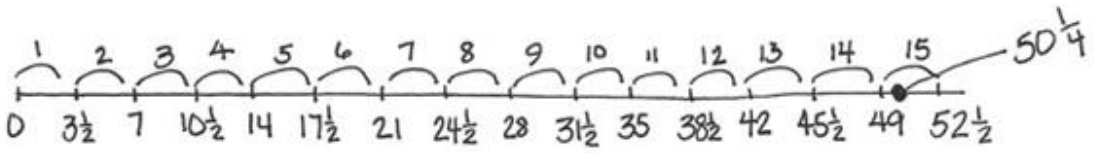
Answer: 36 hundred yards
3,600 yards

   b. There are 1,760 yards in one mile. About how many miles will a runner have to run before seeing both a water station and trail marker at the same location? Calculate the answer to the nearest hundredth of a mile.

```
      2.045
1,760)3600.00
     -3520
      -800
         0
      -8000
       1040
      -9600
      -8800
        800
```

2.05 miles

c. The PTA wants to cover the wet areas of the trail with wood chips. They find that one bag of wood chips covers a $3\frac{1}{2}$ yards section of the trail . If there is a wet section of the trail that is approximately $50\frac{1}{4}$ yards long, how many bags of wood chips are needed to cover the wet section of the trail?



They need more than 14 but less than 15. They need 15 bags to have enough.

$\frac{201}{4} \div \frac{7}{2} = \frac{201}{4} \div \frac{14}{4} = 201 \div 14 = \frac{201}{14} = 14\frac{5}{14}$

5. The Art Club wants to paint a rectangle-shaped mural to celebrate the winners of the track and field meet. They design a checkerboard background for the mural where they will write the winners' names. The rectangle measures 432 inches in length and 360 inches in width. Use Euclid's Algorithm to determine the side length of the largest square they can use to fill the checkerboard pattern completely without overlap or gaps.

length - 432 inches
width - 360 inches

$$\begin{array}{r} 1 \\ 360\overline{)432} \\ -360 \\ \hline 72 \end{array}$$

or

$$\begin{array}{r} 1 \\ 360\overline{)432} \\ -360 \\ \hline 72 \end{array} \qquad \begin{array}{r} 5 \\ 72\overline{)360} \\ -360 \\ \hline 0 \end{array}$$

$432 = 360 \cdot 1 + 72$

$GCF(432, 360) = GCF(360, 72)$

$72 = 72$ ✓

The side length of the largest square they can use is 72 inches.